WHAT IS CLAIMED IS:

1. A device for sensing the pressure of an environment, comprising:

a capillary having a proximal end and a distal end, and a bore extending therebetween;

an optical fiber having a proximal end and a distal end, the distal end configured to partially reflect light, the distal end being disposed within and extending through the bore of the capillary to the distal end of the capillary;

a tube having a proximal end and a distal end and a length;

a plug having a proximal end and a distal end, the distal end configured to reflect light, the distal end of the plug disposed in an opening at the distal end of the tube;

wherein the optical fiber and capillary are inserted into an opening at the proximal end of the tube for a selected distance such that a gap is formed within the tube between the distal end of the optical fiber and the distal end of the plug.

2. The device of claim 1, wherein the optical fiber is fused to the capillary, and the capillary is fused to the tube, and the plug is fused to the tube.

3. The device of claim 1, wherein the capillary is formed from fused silica.

4. The device of claim 1, wherein the tube is formed from fused silica.

5. The device of claim 1, wherein the plug is formed from fused silica.

6. The device of claim 1, wherein the gap is filled with a gas.

7. The device of claim 1, wherein the gap contains a vacuum.

8. The device of claim 6, wherein the gas is air.

9. The device of claim 1, wherein the distal end of the plug is an optically polished mirror.

10. The device of claim 1, wherein the distal end of the plug has a coating to provide relatively high optical reflectivity.

11. The device of claim 1, wherein the reflectivity of the distal end of the plug is approximately 100 percent.

12. The device of claim 10, wherein the coating is a metal coating or other high reflective coating.

13. The device of claim 12, wherein the metal coating is selected from the group consisting of gold, silver and aluminum.

14. The device of claim 1, wherein the distal end of the optical fiber is polished flat.

15. The device of claim 1, wherein the distal end of the optical fiber is a curved surface.

16. The device of claim 1, wherein the distal end of the optical fiber has a coating to increase the reflectivity of the distal end of the optical fiber above the reflectivity of a glass to air interface.

17. The device of claim 1, wherein the optical fiber is a single mode fiber.

18. The device of claim 1, wherein the optical fiber has a core and a cladding layer.

19. The device of claim 1, further comprising at least one periodic refractive index perturbation disposed in the optical fiber at a location proximal to the distal end of the optical fiber for providing temperature compensation.

20. A pressure sensor for use in harsh environments, comprising:

a sensor assembly including:

a capillary having a proximal end and a distal end, and a bore extending therebetween,

an optical fiber having a proximal end and a distal end, the distal end configured to partially reflect light, the distal end being disposed within and extending through the bore of the capillary to the distal end of the capillary;

a tube having a proximal end and a distal end and a length, and

a plug having a proximal end and a distal end, the distal end configured to reflect light, and the distal end of the plug is disposed in an opening at the distal end of the tube, wherein the optical fiber and capillary are inserted into an opening at the proximal end of the tube for a selected distance such that a gap is

formed within the tube between the distal end of the optical fiber and the distal end of the plug;

a housing defining a sensor chamber, the housing having a proximal end and a distal end, the distal end of the housing having a port formed therein, the sensor mounted within the sensing chamber such that the proximal end of the optical fiber extends through a pressure seal disposed in a wall of the housing forming a proximal end of the sensing chamber.

21. The device of claim 20, wherein the sensing chamber is filled with a fill material.

22. The device of claim 21, wherein the fill material is a non-flowing, compressible material.

23. The device of claim 20, further comprising an isolator means mounted at the distal end of the housing and in communication with an interior of the sensing chamber through the port.

24. The device of claim 23, wherein the sensing chamber is filled with a fluid.

25. The device of claim 23, wherein the isolator means is a bellows.

26. The device of claim 23, wherein the isolator means is a structure responsive to changes in pressure and capable of communicating such changes in pressure to the sensing chamber.

27. A pressure sensing system for sensing pressures, comprising:

a light source;

a bi-directional coupler in optical communication with light source;

a pressure sensor having a Fabry-Perot optical cavity, the pressure sensor in optical communication with the bi-directional coupler, the bi-directional coupler providing a pathway for transmitting light from the light source to the pressure sensor and also providing a pathway for transmitting light reflected by the Fabry-Perot optical cavity of the pressure sensor; and

analyzing means in optical communication with the bi-directional coupler for analyzing the light reflected by the Fabry-Perot optical cavity in the pressure sensor to determine changes in pressure sensed by the pressure sensor.

28. The system of claim 27, wherein the light source is a tunable laser.

29. The system of claim 27, wherein the analyzing means is an optical power meter.

30. The system of claim 27, wherein the analyzing means is an optical spectrum analyzer.

31. The system of claim 27, wherein the bi-directional coupler is a circulator.

32. The system of claim 27, wherein the optical communication between the light source, bi-directional coupler, pressure sensor and analyzing means is provided by optical fiber.

33. The device of claim 1, wherein the distal end of the optical fiber is flat cleaved.